

**NAVAL WAR COLLEGE
NEWPORT, R.I.**

**MULTIPLY BY 10 - DIVIDE BY 9
IS TECHNOLOGY A FORCE MULTIPLIER OR FORCE DIVIDER IN
JOINT COMBAT OPERATIONS?**

by

**Ann Jackson
Civilian, NH-IV, USMC**

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

**Professor Albion Bergstrom
Professor Burton Waltman, CDR, USN
JMO Department**

6 May 2003

MULTIPLY BY 10 - DIVIDE BY 9
IS TECHNOLOGY A FORCE MULTIPLIER OR FORCE DIVIDER IN JOINT
COMBAT OPERATIONS?
Table of Contents

INTRODUCTION	1
<i>Technology and the Military – A “Blissful Marriage?”</i>	1
INSTANT MEDIA – INSTANT NEWS	2
<i>History in the Making: The Thrill of Visibility and the Agony of Indiscreet</i>	3
<i>The Public Now Knows and the Public Knows NOW</i>	5
<i>Honest "ABCs" and the Benedict Arnetts</i>	6
INFORMATION WARFARE/INFORMATION OPERATIONS AND THE “DIGI-WAR”	8
<i>The Curse of King Midas</i>	9
<i>Five Smooth Stones</i>	10
<i>Midas Spoke Greek and Phrygian</i>	12
TRADING BODIES FOR TECHNOLOGY	13
<i>People + Technology = Success Or Technology² = Success</i>	15
<i>Sacrificing Human Intuition for Artificial Intelligence</i>	16
<i>Human Factors Engineering: Designing Technology Around the Human</i>	17
LESSONS LEARNED AND LEARNING LESSONS	18
<i>Understanding Tsunami and Riding the Wave</i>	18
<i>Respecting Tsunami – Power Corrupts</i>	19
THE SUM OF ALL FEARS	19
ENDNOTES	21
BIBLIOGRAPHY	23

MULTIPLY BY 10 - DIVIDE BY 9
IS TECHNOLOGY A FORCE MULTIPLIER OR FORCE DIVIDER IN JOINT COMBAT
OPERATIONS?

I. INTRODUCTION

Technology and the Military – A “Blissful Marriage?”

In light of increased U.S. military involvement in current global combat operations, including the war on terrorism and efforts in Afghanistan; Homeland Security; operations in Bosnia; drug interdiction; and Iraqi Freedom – coupled with the national and global economic problems, shrinking budgets, and shrinking forces, the United States must maximize the efficiency of the design and employment of its joint combat forces. Technology has been nominated as the tool, or “force multiplier” to accomplish this, however, is technology a force multiplier or a force divider in joint combat operations? For the purposes of this paper the discussion of technology will be focused on information technology (IT), although there will be references to other forms of technology since all are germane. It should also be understood the use of the terms “joint forces” or “joint combat operations” does not always mean Army with Navy with Marine Corps with Air Force with Special Forces with Coast Guard. Permutations of the “joint forces” are mission and objective specific.

The United States is the most proficient and prolific nation in using technology to enhance its military superiority and it has been a happy, but rocky marriage because this achievement is limited in scope and vision as technology can be a dual-edged sword. Three instances of IT being dual-edged this paper will address are the media insertion with combat forces; the trade off of IT for people; and the information warfare (IW)/information operations (IO) aspect of joint combat. IT provides the joint force commanders (JFCs) with

great advantages over other nation's armed forces, but alone is not the "end-all, beat-all." Achieving operational objectives while providing joint operational force protection is an art; how technology fits into the picture is the pseudo-science. The United States needs technology: with one of the smallest and all-volunteer military forces in the world, coupled with increased military operations, it is quickly evident that people plus something else is needed, namely technology in its varied forms, from precision-guided munitions to laptops on the battlefield, as Figure I-1 describes. Consider operating in the joint environment and the equation can quickly change to Figure I-2. Focus must shift from how to insert technology to make the joint combat forces more proficient to include how technology affects joint combat force design and employment.

$$\text{people} + \text{technology} = \text{military supremacy}$$

Figure I-1

$$[\{(\text{which people} + \text{which technology})(\text{different Services})\} \{ \text{in which environment (land, sea, air, space)} \} (\text{which threat/threat deterrent}) \} (\text{technology constraints}) = \text{military supremacy}]$$

Figure I-2

II. INSTANT MEDIA – INSTANT NEWS

*"Welcome to Generation Now."*¹ Getting the Services and their components working harmoniously in the ongoing effort of defending the nation and defeating all enemies is difficult. Technology has allowed new ways of fighting and recording military operations, of most notable concern, the media insertion into combat forces. This can greatly increase the JFCs ability and capability to manage the factors of space, force (including requesting the appropriate forces), and time. Figure II-1 is an example of the strategic objective for media insertion, and subsequent operational objectives that may have been considered, and some

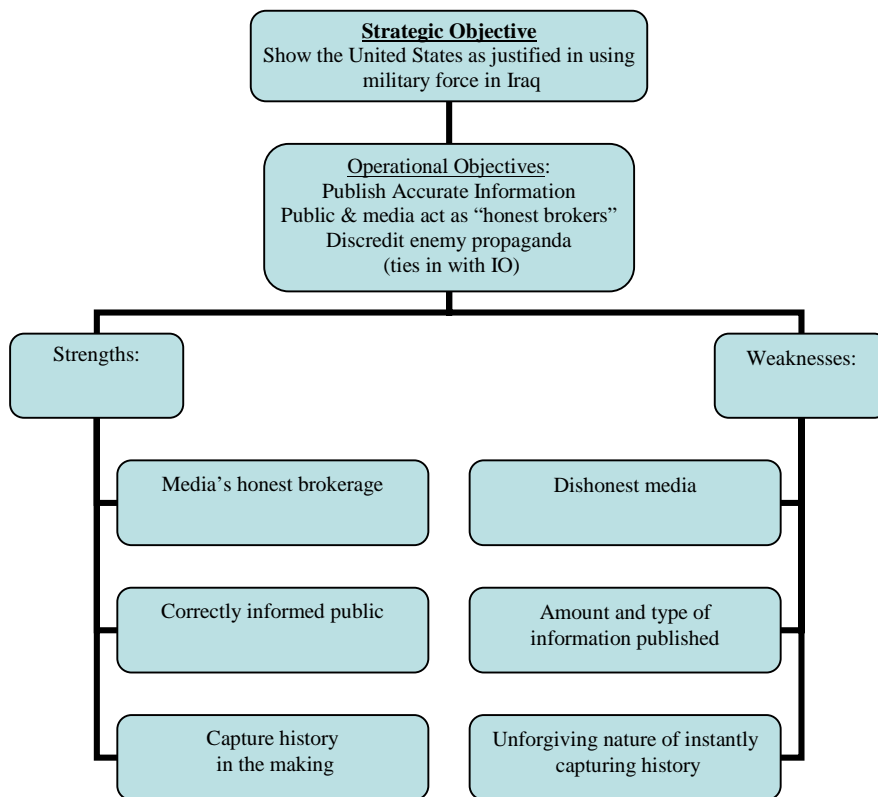


Figure II-1

strengths and weaknesses that should be considered by the JFCs as they conduct the business of war. If the strategic objective for media insertion with combat troops is to show the world the United States is not a warmonger but justified in the use of armed conflict, and the operational objectives are to publish accurate information; let the public and media act as honest brokers; and discredit enemy propaganda, then there are three distinct strengths that make this achievable. The strengths of media insertion include keeping the public informed of military efforts, keeping the US military “honest” in the eyes of all involved, and capturing history in the making. The weaknesses in obtaining the objectives are the antiphony of the strengths: dishonest reporting, the over-informed public, and the unforgiving nature of instantly catching history.

History in the Making: The Thrill of Visibility and the Agony of Indiscreet

Events were captured as they occurred in real time as cameras rolled night and day. Historians, academicians, and commanders have information to use in the proliferation of

books and documentaries that will be produced, not only for posterity's sake, but also for commanders who can use these near-term history lessons to change occurring employment and engagement operations. This gives commanders an edge they have not previously enjoyed, but it can be an unforgiving taskmaster. JFCs can use this information as they plan post-war operations and future operational planning, having a historical example of what combinations of Services and components worked in which situations. However, a weakness of capturing history in the making is downplaying the horrors of war and its unforgiving nature. Combat forces are not trained actors: if a Serviceman makes a mistake it is captured and could result in rash actions being taken against a person trained to fire a weapon with precision accuracy. Warfighters must learn to "smile for the camera" without the training needed for dealing with the media, couching comments made in the heat of battle, sometimes with a microphone and camera in their face as they actively engage the enemy. Combat forces need training to deal with this dimension of warfare, otherwise, a mistake is made and the entire military pays for it, as well as the United States in the public-relations war, whether it is shooting an innocent person or speaking their mind without thinking, giving the JFC little time to react since the information cycle time for instant media is virtually non-existent. There are costs in time and money to train Service members how to engage the media without being an affront and without divulging information and the JFCs suffer as they are second-guessed and vulnerable to micro-management on judgment calls made during battle. People watch the news and make snap judgments that can cause significant changes to ongoing or planned operations. Media insertion into combat units can aid JFCs in the public relations side of warfare by keeping the public informed and supportive of the military and military operations.

The Public Now Knows and the Public Knows NOW

Public opinion is not only important to winning wars; it is crucial to psychological and post-war support and its lacking can diminish troop morale. Understanding why wars are fought and what the military undergoes endows pride in the Service member's job and contributes to political, social, and economic support for military actions. The associated weakness of keeping people informed is primarily dependent on the sway and fickleness of public opinion. During Iraqi Freedom, service members were killed and pictures flooded the airwaves. In an instant the tide of public opinion could have been swayed against the military effort. Public awareness and concern generally reaches a certain peak, often accompanied by frenzied efforts to understand or solve a real or perceived problem. These frenzied periods of interest are short-lived and once over, are followed by lethargy then apathy.² War on television was sacrosanct, reserved for history, now it is merely "television" like the "reality" shows. The JFC stands to lose not only the strategic and operational advantages provided by technology but also the war on the IW/IO fronts. Instead of convincing people that war is sometimes just, right, and necessary, people are being desensitized to the horror and brutality of war at the expense of the warfighter. The videophone pictures of combat troops identified could have fallen into enemy hands, removing any doubt as to their rank, mission, specialty, unit, or any other information that is best kept "close-hold". As a force multiplier an informed public is a great plus for morale and support but as a divider, it is equally harsh at putting the military, primarily the JFC, on the spot and damaging credibility. Media insertion does, however, contribute to the media's usefulness as an honest broker.

Honest "ABCs" and the Benedict Arnetts

The news media can be an honest broker—keeping the joint forces honest, reporting honestly, and ensuring the “truth” is reported. With 24-hour coverage of the war in Iraq via reporters embedded in combat and support units, the world saw first-hand what happened on the front lines, good or bad. The news media reporting the facts precluded the enemy from using its own propaganda to sway public opinion or incite other factions to join its cause. The news media reported on what the U.S. and coalition forces fired, what targets they hit and missed, and blue-on-blue incidents. JFCs can use this information in current and future operations by fine-tuning training, employment, and communications, as well as in design and employment of IW/IO to support their military objective.

On the other side of the coin, a few bad reports and indiscreet reporters highlight the vulnerability of instant-media and instant news. In March 2003, several news networks reported on the departure time, location, and approximate arrival time of U.S.-led coalition force bombers, broadcasts viewed by friend and foe alike. Although possibly an isolated incident, the detriment to joint operations and the entire objective could have been costly. Reporters were directed to leave Iraq because it appeared reporting the news was more important to them than safeguarding valuable information that could better ensure the safety of U.S. and other coalition troops or the reporters provided information damaging to morale and encouraging to the enemy³ with information cycle times as short as 18 minutes, as was the case with Peter Arnett who was ousted from Iraq. Commanders are hard pressed to plan for or mitigate this type of damage with such a miniscule cycle time. Add to this the frustration of designing joint forces with embedded media personnel, people who can leave at any time, and their departure, or more relevantly, their reporting, can divulge valuable secrets

such as troop location, targets, arms, and armament. JFCs are responsible for these extra people and for what they do while embedded with troops. This involves more people in combat and support, and in harm's way, in direct contradiction to Secretary of Defense (SecDef) Donald Rumsfeld's policy of reducing the number of people in combat. The United States has opened the doors to the media to report truth as it is occurring, which is a plus, but this open door policy allows a few indiscreet and indiscriminate people to create situations that are damaging and potentially deadly, giving JFCs another aspect to factor in as they plan and execute operations.

Media insertion with its instant reporting facilitates better relationships between the military, civilian world, and the media. It plays well into the IW/IO world for current and future operations and can be beneficial for the JFCs in designing and employing their forces. On the opposing end of the argument, capturing war horrors without censoring the brutality and penalizing the military for what happens in the heat of battle negates the use of media insertion. Notwithstanding, media insertion's best utility is in keeping the public informed and supportive of the military. As a result of media insertion, the factor of time is the greatest factor affected, leaving JFCs with less time to react to compromises, which consequently affect the management of force and space. This negative impact affects IW, IO, and the "digi-war" waged in Iraq as well as future endeavors. JFCs cannot change this addition to their forces, but in better understanding them, can better plan to normalize the challenges they present.

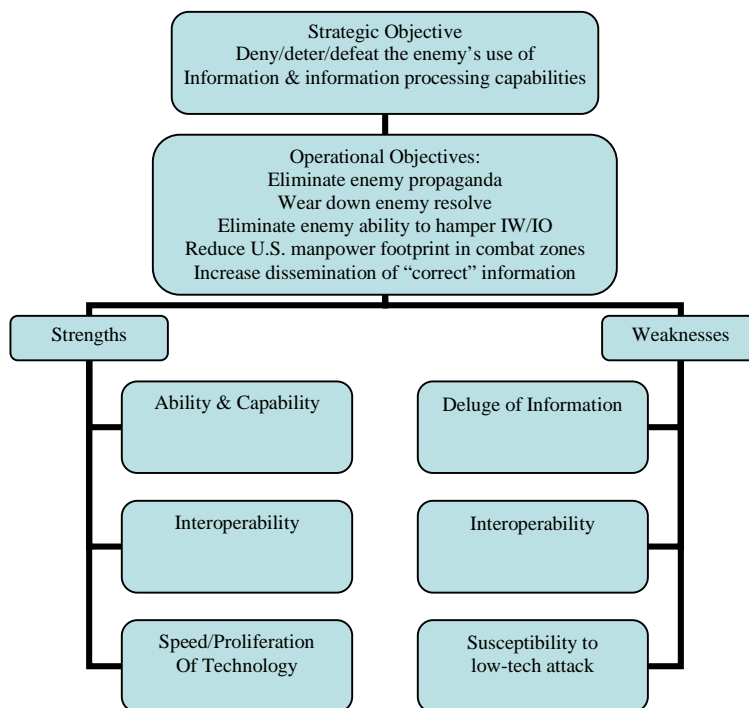


Figure III-1

III. INFORMATION WARFARE/INFORMATION OPERATIONS AND THE “DIGI-WAR”

“In general, the value of information increases with the number of users.”⁴ Figure III-1 highlights a proposed strategic objective for information warfare (IW)/information operations (IO). This example, again referring to Operation Iraqi Freedom, lists the strategic objective of IW and IO (including the media) as denying, deterring, and defeating the enemy’s information processing capabilities using a combination of information technological (hard/soft/etc.), psychological, and physical means. JFCs can review their operational force makeup to build on strengths, reduce weaknesses, and mitigate vulnerabilities. The strengths the commanders have in this area include the interoperability, proliferation, ability, capability, and speed of technology, to name a few. These strengths are countered by serious weaknesses of which the deluge of information, interoperability, and susceptibility to low-tech attack are three key issues. These weaknesses affect the JFCs’ optimal use of forces.

The Curse of King Midas

The JFC is flooded with information that must be assimilated, disseminated, digested, regurgitated, analyzed, and processed in constantly decreasing cycle times, otherwise, the information gets old, and old information can be worse than no information. Due to the ease of transmitting information, it is assumed everyone needs all the information so that everyone is singing off the same sheet of music, forcing the gleanings of “need to know” information from “nice to know” information. However, the commander of First Cavalry may not need to know the situational report for an aircraft carrier or vice versa. Dr. Milan Vego states because of the much longer distances involved, the operational commander needs a clear understanding of the relationships among the factors of space, time, and forces⁵ and Lt Gen William J. Donahue, Director, Air Force Communications and Information Center stated the need to get information is a key component of the expeditionary aerospace concept and how effective that concept will be is dependent upon the ability to rapidly collect, process, analyze, disseminate, retrieve, and protect information while denying these capabilities to the adversary.⁶ With all the information clutter, what information does the JFC use to manage space? Time? Force? Looking at force and forces, how many people will be needed to effectively manage all the information that rushes in and out and how can the JFC get this information to the tactical commanders expeditiously without overloading them? What information is trustworthy? Old? Unconfirmed? This tsunami of information requires more people and *specialized* people.⁷ Joint forces must be designed with the correct mix of forces, including support infrastructure, to handle the information wave. This is critical when deciding between important and urgent: generally more importance is placed on information based on the order it is received and not necessarily its actual importance.⁸ Units must be

trained to deal with the seemingly unending flow of information and turn the information into a useful weapon for them and a weapon against the enemy as rapidly as possible. IW/IO is not new—utilizing IT in this method of warfare is the force multiplier in joint operations. The tidal wave of information designed to help JFCs manage time, space, and forces can be a deadly divider because of the increasing flood of information. Technology added a facet to IW/IO and concurrently changed the way adversaries attack. Having more information to use than the adversary is a double benefit: there are more tools, provided those tools are useful. Any tool, even five smooth stones, can fell a giant: the trick is to ensure the JFC has the correct stones, knows how to use them, and the JFC is not the giant.

Five Smooth Stones

The 1991 Gulf War has been called the first “information war” as IT significantly improved the effectiveness of every aspect of warfare from logistics to C4ISR. That effectiveness deterred some potential adversaries from taking on United States and allied forces directly and stimulated adversaries to think of non-conventional or asymmetrical means of countering conventional forces,⁹ but this does not preclude them from using conventional means when best suited for the job. Iraqi Freedom is coined as the digital battlefield or digi-war field test. A *Marine* behind enemy lines spots the target, sends the information digitally using *Navy* and *Air Force* systems, and within minutes the target is destroyed by an air strike. The connection of the dots includes GPS, communications satellites, etc. in an orchestrated manner the SecDef says reduces the number of people required.¹⁰ These connected dots are vulnerable to being compromised, jammed, hacked, infiltrated, and corrupted using fairly unsophisticated and low-cost means. Once this occurs, the information transmitted to and from the command center to help the JFC better manage

space, force, and time becomes useless. The lack of sophistication of the current enemy does not necessitate the lack of sophistication of anyone helping them and jamming GPS systems, sending incorrect signals, or picking up cell phone calls can be a relatively inexpensive and low-fidelity means to reduce IW/IO and rob the JFC of control of at least one, but most likely all three of these operational factors. Commanders cannot plan against all types of attacks but they can design and employ their forces to deter as many low-tech attacks as possible while simultaneously using high and low tech methods to deny the enemy the capability to fight, physically, using informational, and psychologically. Unfortunate for the commanders is they generally do not control the elements of time and space in an attack. The adversary normally chooses the time, place, medium, and method of attack and developing perfect defenses against many attacks is expensive, if possible.¹¹ Reliance on technology is risky, like all warfare. Disruption or denial of key information and information services is the primary goal of IW—the United States effectively uses this tool against its enemies who in turn are learning to use it against the United States.¹² For JFCs and the units under their command, a paper map may be more valuable than a GPS receiver. If the map catches a bullet or some shrapnel it is still useful, but if the receiver suffers the same fate it becomes an expensive trinket that is difficult to replace.¹³ Carrying additional gear for redundancy may not be a practical solution as carrying extra gear affects both the combat and support structure. Remember the old logistics adage: *every piece of gear requires a body to support it*. This affects force composition and the employment of different or additional personnel must be considered despite the SecDef's tenet of more technology = less people. IT creates phenomenal opportunities for the JFC to exploit time, space, and force, making it SecDef's force multiplier. Simultaneously, IT creates vulnerabilities and weaknesses that hostile

forces are learning to exploit both from close in and at distances, and they are using relatively low cost and low-tech means to accomplish this. Rocks and bullets are cheaper than GPS receivers, and depending on the area of conflict, are in far more abundance. JFCs who put all their employment eggs in the technology basket are asking for trouble, and asking for help is not always simple as the Services do not necessarily speak the same language.

Midas Spoke Greek and Phrygian

Joint combat forces are absolutely dependent on the Services being able to communicate. This problem is exacerbated by IT since the Services do not use the same information systems platforms or common terminology. How is an Army JFC expected to sift through the information clutter, then understand and use IW/IO to better manage space, time, and force when the very **terminology** of the clutter is confusing at best and unintelligible at worst? With the continual reduction of decision cycle time, deciphering information faster increases in criticality. This explains why interoperability is listed both as a strength and a weakness. The Department of Defense (DOD) is trying to aid JFCs by mandating systems that communicate freely across the Services to minimize and eventually eliminate this weakness. Two programs in the works include the Global Combat Support System (GCSS) and the Global Command and Control System (GCCS). GCSS will give the JFC a common logistics and support data picture, which has major implications on joint force design and employment. GCCS will aid the JFC in the joint command and control (C2) area. These two systems can aid in designing and employing the leaner military the SecDef says the United States military needs. However, if done improperly these two IT systems could cause joint operating forces to be too expensive to employ, which could result in a reduction

of personnel, which in turn could lead to increased reliance on technology, and the do-loop spirals out of control with the JFC left holding an empty bag.

The essentiality of IW/IO to the JFCs cannot be overstated. This more definitively honed method of warfare buys the JFCs time—they can better plan; force—they can give the appearance of more force (or less depending on the objective), which can utterly confuse the enemy; and space—they can increase their maneuverability space by simply having the enemy believe something that is not true, or change their behavior due to pain avoidance. This great force multiplier must be carefully tempered with focus on what the JFC needs to accomplish the mission, including assembling the right mix of forces and correct type and amount of information. In either case, people are needed, and technology is infamous for requiring more people, not less.

IV. TRADING BODIES FOR TECHNOLOGY

*People are the link that is foreshadowed, and sometimes ignored.*¹⁴ The JFC is the on-site manager of the forces, and reducing people as an offset of increased technology receives mixed reviews. Looking at Figure IV-1, if the strategic objective of trading people for technology is to reduce the human footprint in war, and the operational objectives include increasing technology and decreasing people and exploiting that technology to leverage

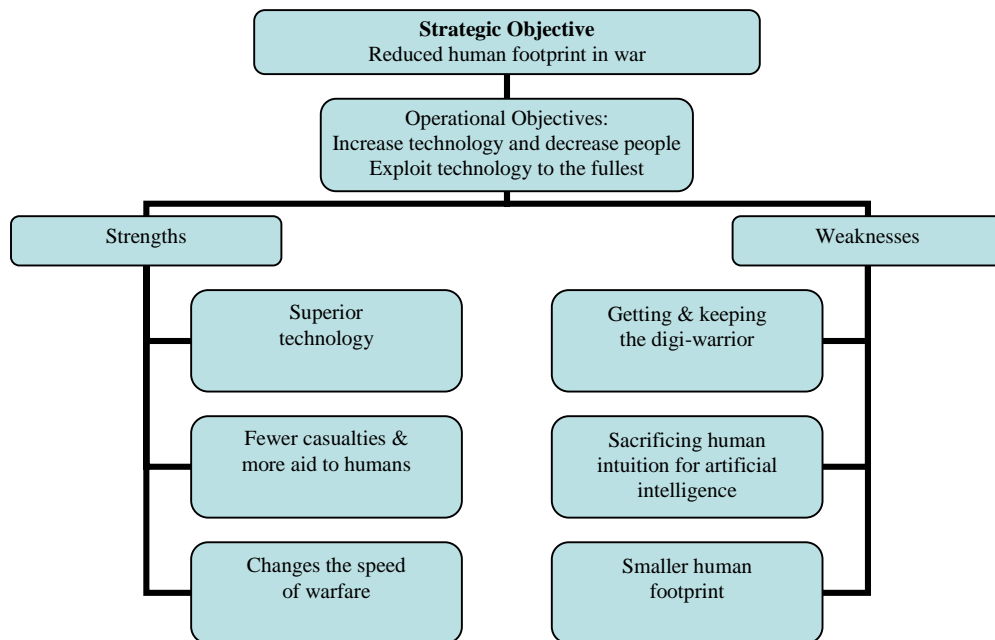


Figure IV-1

warfare in the JFC's favor (synonymous with IW/IO), then three critical strengths and weaknesses must be considered by the JFC. Superior technology gives the JFC a superior edge; it could reduce casualties and reduce the amount of people being supported during combat; and it changes the speed of warfare, as was evident in Gulf War I and Operation Iraqi Freedom. Likewise, the weaknesses are not enough people to support combat operations; getting and keeping warriors skilled in the "digi-war" concept; and sacrificing human intuition for artificial intelligence. The SecDef stated technology is a force multiplier and will reduce the number of people involved in combat, supporting leaner armed forces.¹⁵ The United States is going through the litmus test of the "digi-war" concept in Iraq and the SecDef has dissent on this concept with commanders who prefer more people coupled with more technology and not simply more technology. Maj Gen Franklin "Buster" Hagenbeck stated he views technology as an enabler (force multiplier) and agrees he wants more, but he also states it cannot replace the soldier on the ground.¹⁶ Technology creates the illusion that

fewer people are needed and the belief that better IT systems will require less human intervention, a myth blown by something as commonplace as email.

$$\textit{People} + \textit{Technology} = \textit{Success Or Technology}^2 = \textit{Success}$$

The SecDef wants the digital warrior, for this is how he envisions the United States military will fight future wars; however, the preponderance of focus and attention should be on people since it is the human brain that is the subject and target of IW/IO.¹⁷ The digital warrior comes with a host of weaknesses and vulnerabilities in core processes such as recruitment, training, and employment. JFCs get whatever recruits are in the Services: the United States is a volunteer force and when the economy is good, military recruitment generally is not. Once people with IT skills or aptitudes are recruited they must be trained and kept at the forefront of technology. The training cycle, which includes basic training and any other specialty training that is exclusive to the military, is 18 to 24 months minimum. Information cannot become a weapons systems until there are trained *career forces* in place to convert the broader picture or philosophy into operational art,¹⁸ making it useful to the *forces* of today and tomorrow. Once the person is trained and develops the proficiency that comes with time and experience, he or she is a valuable asset inside and outside the military, and they are in short supply and high demand. The JFC needs the best and brightest, and the JFC needs to know what abilities these people are bringing to the fight, and if technology is going to replace people, then they need to know how to leverage shrinking human resources with increased support of technology. In concert with this, author Don Gordon stated:

*“It will be a battlefield on which not only the command and control of armies, navies, and air forces and weapons in space will depend upon tens of thousands of emitters conveying messages, digital firing data, imagery, intelligence, logistics, and detection information . . .”*¹⁹

With technology force multiplying in this sense, it will take a substantial *force* of people, *specialized* people, to make it happen and keep it happening. Even if these tasks are contracted out, which some assuredly will be, the JFCs must take into consideration which human assets are theirs (military) and which human assets they are responsible for that are not theirs, such as contractors on the battlefield and embedded media personnel. Shifting end-strength will not work, especially when the military departments want increases. Technology reduces some of the JFCs' tasks or areas of responsibility while creating others, and demands more intelligent people. Technology cannot think, which is why people are so essential to it and not the other way around. To become lean, agile, and lethal, JFCs need capable, thinking people to make the decisions that are aided by technology. JFCs must have adequate human resources to effectively use the tools of IW/IO, otherwise, they have a 21st century lodestone around their neck.

Sacrificing Human Intuition for Artificial Intelligence

The more efficient network-centric team replaces the sneaker-net team, but to perform network-centric warfare the way it was intended means more *specialized* people. Someone must ensure the connected dots from the gunner in the field to the command center work; someone must decipher the information; someone must decide on its usefulness and applicability; someone must transmit the information. "Someones" are required in the forward deployed units, the rear deployed units, C2 areas, the command center, various bases of operations, and back at the point of origin. Some of these "someones" can be the same person, and the JFC is responsible for ensuring he or she has all the right "someones" in the right places at the right times. Lt Gen Joseph Kellogg Jr., Director of C4 for the Joint Staff states network-centric warfare is comprised of three equal parts: technology, organization,

and culture and if there is not harmony in all three then success has not been achieved.²⁰

JFCs must make this harmony happen, and they can receive all the information their grey matter can process to help make decisions, but it does not replace their decision-making, and can actually hamper it because there is so much information and so little processing time. Technology can take over some functions currently performed by humans, but *control* of a function of warfare does not seem to be one of them. It is more logical to balance technology insertion to enhance people's performance, although there are instances when a function can and should be replaced. IT insertion in itself is an incorrect statement: often a problem is identified, a system is designed, then humans are inserted, even though the systems are designed to make the warfighter's job easier. JFCs have the additional task of ensuring these systems are compliant with other systems and do not produce information overload. If the soldier in the field gets more information than he or she can use or handle, the information becomes useless.

Human Factors Engineering: Designing Technology Around the Human

The man-machine interface is more important today than ever. The gear fitting the human is important, but the intricate side of human factors engineering is how the human is affected by the gear. If the JFC is involved in a digi-war, a necessary part of the digitized battlefield will be the synergy from the man-machine interface.²¹ The Army's early attempts at providing a common operating picture to the dismounted soldier using personal digital assistants had limited success: it was a useful tool but it distracted the soldier from the task at hand.²² JFCs want more lethality and agility, and IT can support this, but the human brain can only process so much information at a time and this is situation-dependent. The Services continue to wrestle with producing the right amount of data being pushed and pulled to the

warfighter, especially since humans are the most unpredictable element of technology. Two other problems JFCs must take into consideration while planning operations and employing forces are techno-fright, particularly among older baby-boomers, and the problem with great quantities of data missing one key ingredient thus rendering the data and information useless or dangerous. Training is required up and down the chain as commanders' jobs have changed radically since 1991. "Designing" humans around technology is a lose-lose game plan because the emphasis is on the controlled instead of the controller. The JFC's span of control increases exponentially, simultaneously with decreasing cycle time. Equally bothersome are the opportunities technology affords senior leadership and politicians to micro-manage JFCs, intentionally or not, particularly with embedded media.

The IT armor can be heavy – it presupposes things such as fewer bodies needed to keep it standing and imperviousness to defeat. It overlooks simple but critical kinks, and is a miserable force multiplier when devoid of its reason for existence – giving a critical edge to the warfighter.

V. LESSONS LEARNED AND LEARNING LESSONS

Understanding Tsunami and Riding the Wave

"All the information technology in the world would not enable the Washington Redskins to play soccer."²³ This humorous quote contains great truths, namely, people are *required* and without proper training IT is useless. A better communications platform means nothing if it cannot communicate the right message to the right people at the right time. IT changed the dynamics of life in every area, especially the military, a revolution that DOD started. JFCs operate under limited time and resources and cannot afford to train everyone, every time, on every piece of equipment in the actual environment so the gap is filled by technology.

Training forward deployed troops in the Middle East before war broke out was a double

benefit as training and proficiency were maintained while becoming acclimated within the region. But like riding the great wave, it can quickly become a force divider: there is too much, too quick, and with unbelievable results that rapidly change the face of warfare. Technology continues to evolve, enemies continue to adapt, commanders continue to change, but change must be on the JFCs' terms since they are most responsible for mission accomplishment, for what happens in theater, and for the forces they design and employ.

Respecting Tsunami - Power Corrupts

With the proliferation of technology making the greatest military in the world even mightier, there is a tendency to forget the simple things in life, namely—people, not technology make the systems work, and arrogance generally leads to trouble. Missions are accomplished when JFCs get the right tools in people and technology, and in the right amounts to achieve operational and strategic objectives. Technology has many vulnerabilities, some new, and enemies are continually looking for ways to exploit them. Complacency, over-reliance, and the false notion of intelligence are costly IT mistakes the JFCs cannot afford to make or have imposed upon them.

VI. THE SUM OF ALL FEARS

The JFC's job is complicated in this age of precision guided munitions and GPS systems. He or she must still conduct the business of war, and as more weapons are added to the arsenal, they must choose between them to assure objectives are met and missions are successfully accomplished. Media insertion into combat forces washes as a force multiplier and divider. History captured is the greatest plus, followed by its facilitation of honest brokering. The greatest negative however, is the media divulges too much information, in concert with the public being fed too much information. It also sets the "trend" for future

battles, which may not be positive in nature or impact. Contrarily, IW/IO is more of a force multiplier with the aid of IT, but caution is still warranted as IT leans to excess. It is fallacious to trade people for technology. It can reduce the number of forces in the direct line of fire, but technology has a long history of adding rather than subtracting people, and there is no substitute for a human brain. Data is useless unless someone makes information of it; information is useless unless someone receives, understands, and uses it, and the JFC understands this more than anyone. The JFC must understand that all the benefits technology provides come with an almost equal number of risks, quite like multiplying by ten then dividing by nine. The JFC is mission-focused, and in that mission envelope are two very important things: people and technology. Both have associated risks, and care must be taken to assure focus is on the resource of people, with technology as a force multipliers enhancing the human resource.

MULTIPLY BY 10 - DIVIDE BY 9
IS TECHNOLOGY A FORCE MULTIPLIER OR FORCE DIVIDER IN JOINT
COMBAT OPERATIONS?

ENDNOTES

¹ Author Unknown.

² David S. Alberts. Defensive Information Warfare. Center for Advanced Concepts and Technology, National Defense University. 1998. 8.

³ “US TV Correspondent Peter Arnett Sacked for Comments about Iraq War” on Yahoo News/Agence France Presse, 31 Mar 03. http://story.news.yahoo.com/news?tmpl=story&u=/afp/20030331/ts_afp/iraq_war_us_arne.

⁴ Joint Doctrine Capstone and Keystone Primer, dated 10 September 2001. 84.

⁵ Dr. Milan Vego. Operational Warfare. 2000. 10-11.

⁶ SrA A.J. Bosker. “Air Force Leaders Chart Course of Information Operations.” Air Force Print News. 29 Mar 00. http://www.af.mil/news/Mar2000/n20000329_000492.html, 1 Apr 03.

⁷ Ante, Balfour, Carey, Cohn, Crock et. al. “The Digital War: The Technology” in BusinessWeek Magazine. 7 April 2003. McGraw-Hill Corporation, New York. 34-38.

⁸ David S. Alberts. The Unintended Consequences of Information Age Technologies: Avoiding the Pitfalls, Seizing the Initiative. Center for Advanced Concepts and Technology, National Defense University, Washington, DC. 1996. 33-35.

⁹ David S. Alberts. Defensive Information Warfare. 13.

¹⁰ Ante, Balfour, Carey, Cohn, Crock et. al. “The Digital War: The Technology” in BusinessWeek Magazine. 7 April 2003. McGraw-Hill Corporation, New York 34-38.

¹¹ David S. Alberts. Defensive Information Warfare. 33.

¹² Baklarz and Forno. The Art of Information Warfare – Insight into the Knowledge Warrior Philosophy. 1996. 70.

¹³ Ibid. 72-73.

¹⁴ James R. Chiles. Inviting Disaster: Lessons from the Edge of Technology. Harper Business, NY. 2001. 27.

¹⁵ Balfour, Crock, Magnusson, and Walczak. “The Doctrine of Digital War” in BusinessWeek Magazine. 7 April 2003. McGraw-Hill Corporation, New York 30-32.

¹⁶ Vernon Loeb. “General Defends Tactics in Afghan Battle.” Washingtonpost.com. 12 Mar 03. <http://www.washingtonpost.com/wp-dyn/articles/A12690-2003Mar11.html>. 19 Mar 03.

¹⁷ Baklarz and Forno. The Art of Information Warfare. 75-76.

¹⁸ Colonel Alan D. Campen. “The Earthly Realities of Cyberspace – Why Information Technology Cannot Connect the Dots.” SIGNAL. AFCEA’s International Journal, Vol. 57, No. 2. October 2002. 37.

¹⁹ Don E. Gordon. Electronic Warfare – Element of Strategy and Multiplier of Combat Power. Pergamon Press, NY. 1981. 2.

²⁰ Dan Caterinicchia. “Net Warfare is Not Just Tech.” Federal Computer Week/FCW.COM. 23 Jan 03. <http://www.fcw.com/fcw/articles/2003/web-net-01-23-03.asp>. 1 Apr 03.

²¹ David Alexander. “Information Warfare and the Digitised Battlefield.” Military Technology. No. 10, Wehr, Wissen Verlagsgesellschaft mbH, Koblenz/Bonn Germany. October 1995. 57-58.

²² R.K. Anderson. “Army Builds Future Combat Systems Around Information Technologies.” SIGNAL, AFCEA’s International Journal. Nov 02, Vol 57, No. 3. 40.

²³ Campen. “The Earthly Realities of Cyberspace – Why Information Technology Cannot Connect the Dots.” 37.

MULTIPLY BY 10 - DIVIDE BY 9
IS TECHNOLOGY A FORCE MULTIPLIER OR FORCE DIVIDER IN JOINT
COMBAT OPERATIONS?
BIBLIOGRAPHY

- Alexander, David. "Information Warfare and the Digitised Battlefield." Military Technology. No. 10, Wehr, Wissen Verlagsgesellschaft mbH, Koblenz/Bonn Germany. October 1995.
- Alberts, David S. Defensive Information Warfare. Center for Advanced Concepts and Technology, National Defense University, Washington, DC. 1998
- Alberts, David S. The Unintended Consequences of Information Age Technologies: Avoiding the Pitfalls, Seizing the Initiative. Center for Advanced Concepts and Technology, National Defense University, Washington, DC. 1996
- Alberts, Dr. David S., Dr. Margaret Myers, and Arthur L. Morey. Network Centric Warfare: Developing and Leveraging Information Superiority. CCRP Publication Series, Washington, DC. 1999.
- Aldinger, Charles. "Confusion Over Status of Geraldo Rivera in Iraq." In Yahoo News/Reuters Celebrity/Gossip. 31 Mar 03. <<http://story.news.yahoo.com/news?tmpl=story2&cid=765&ncid=762&e=11&u=nm/2003>>
- Anderson, R.K. "Army Builds Future Combat Systems Around Information Technologies." SIGNAL. AFCEA's International Journal. Nov 02. Vol. 57, No. 3.
- Ante, Balfour, Carey, Cohn, Crock et. al. "The Digital War: The Technology" in BusinessWeek Magazine. 7 April 2003. McGraw-Hill Corporation, New York
- Baklarz, Ronald and Richard Forno. The Art of Information Warfare – Insight into the Knowledge Warrior Philosophy. 1999
- Balfour, Crock, Magnusson, and Walczak. "The Doctrine of Digital War" in BusinessWeek Magazine. 7 April 2003. McGraw-Hill Corporation, New York

Berkowitz, Bruce D. "Warfare in the Information Age." Issues in Science and Technology. University of Texas at Dallas, Vol XII, No. 1, Fall 1995.

Bosker, SrA A.J. "Air Force Leaders Chart Course of Information Operations." Air Force Print News. 29 Mar 00. http://www.af.mil/news/Mar2000/n20000329_000492.html. 1 Apr 03

British Broadcasting Company (BBC) Television Newscasts - 24 Mar 03 to 16 Apr 03

Cable News Network (CNN) Television Newscasts - 18 Mar 03 to 21 Apr 03

Campen, Colonel Alan D. "The Earthly Realities of Cyberspace – Why Information Technology Can't Connect the Dots." SIGNAL AFCEA's International Journal. Vol 57, No. 2. October 2002

Caternicchia, Dan. "Joint Forces Given New Clout". Federal Computer Week/FCW.COM. <http://www.fcw.com/fcw/articles/2003/0113/news-forces-01-13-03.asp>. 1 Apr 03

Caternicchia, Dan. "Net Warfare is Not Just Tech". Federal Computer Week/FCW.COM. <http://www.fcw.com/fcw/articles/2003/0113/news-forces-01-13-03.asp>. 23 Jan 03

Chiles, James R. Inviting Disaster: Lessons from the Edge of Technology. Harper Business, New York, NY. 2001

Finn, Peter. "Psyops Unit Attacks Iraqis' Minds" MSNBC.com. 31 March 2003. <http://www.msnbc.com/news/893721.asp?vts=040120030850&cp1=1>. 1 Apr 03.

French, Matthew. "Joint Combat Collaboration Under the Gun." Federal Computer Week/FCW.COM. <http://www.fcw.com/fcw/articles/2003/0113/web-joint-01-17-03.asp>. 17 Jan 03

Gordon, Don E. Electronic Warfare – Element of Strategy and Multiplier of Combat Power. Pergamon Press, New York, NY. 1981

Johnson, Major Karlton D. “Rethinking Joint Information Operations.” .” SIGNAL AFCEA’s International Journal. Vol 57, No. 2. October 2002

Joint Doctrine Capstone and Keystone Primer, dated 10 September 2001

Loeb, Vernon. “General Defends Tactics in Afghan Battle.” Washington Post.com. 12 Mar 03. <http://www.washingtonpost.com/wp-dyn/articles/A12690-2003Mar11.html>. 19 Mar 03

McClure, William B. Technology and Command – Implications for Military Operations in the Twenty-First Century. Occasional Paper No. 15 Center for Strategy and Technology. Air University Maxwell Air Force Base. 2000.

MSNBC Television Newscasts - 18 Mar 03 to 21 Apr 03

Stanley, Alexandra. “The TV Watch – Show of Awe: A Thrill, But No Blood.” In The New York Times. A1, B3. New York, NY: 23 March 2003.

“US TV Correspondent Peter Arnett Sacked for Comments about Iraq War” on Yahoo News/Agence France Presse, 31 Mar 03. <http://story.news.yahoo.com/news?tmpl=story&u=/afp/20030331/ts_afp/iraq_war_us_arne>

Vego, Dr. Milan. Operational Warfare. 2000.

REPORT DOCUMENTATION PAGE				<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 6 May 2003		2. REPORT TYPE FINAL		3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE Multiply By 10 - Divide By 9 Is Technology A Force Multiplier or Force Divider in Joint Combat Operations?				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Ann Jackson Paper Advisor (if Any): Capt (USN) Robin Babb				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Joint Military Operations Department Naval War College 686 Cushing Road Newport, RI 02841-1207				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Distribution Statement A: Approved for public release; Distribution is unlimited.					
13. SUPPLEMENTARY NOTES A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.					
14. ABSTRACT Technology has afforded the Joint Force Commanders many capabilities in achieving their objectives. Technology has definitely been an enabler and is continually looked upon to add more to the fight, mostly by adding more technology. However, the addition of technology comes with risks that if not addressed correctly will have a negative impact on force design and employment, especially in combat operations. The paper primarily addresses information technology (IT), however, it does not exclude technology as a whole since it is all inclusive. The paper addresses three particular areas where IT has made a significant impact on how forces are or can be designed and used, such as the insertion of media personnel with combat forces; information warfare and information operations; and trading bodies for technology. These three areas have great potential for JFCs as they conduct the business of war, and likewise have the potential for being great problems for JFCs.					
15. SUBJECT TERMS Information Technology in Joint Combat Operations					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 27	19a. NAME OF RESPONSIBLE PERSON Chairman, JMO Dept
a. REPORT UNCLASSIFIED	b. ABSTRACT UNCLASSIFIED	c. THIS PAGE UNCLASSIFIED			19b. TELEPHONE NUMBER (include area code) 401-841-3556

Standard Form 298 (Rev. 8-98)